Introduction

The publication of the book “Fire and Fury” by Michael Wolff heightened the national angst over the first year of the presidency of Donald Trump. This associated fury includes the natural question of “how did this Presidency occur?” Independent of this recent focus the die was already cast for Historians and Political Scientists to be addressing the question. This paper addresses and answers the question. The answer lies through a quirk provided by a Triple Whammy: a.)The FBI James Comey October 28, 2016 letter to Congress, b.)Republican Driven Voter Suppression and c.) Russian Driven Fake News. Donald Trump became President despite losing the national popular vote to Hillary Clinton by 2.9 million votes. The three swing states of Michigan, Wisconsin and Pennsylvania (hereafter referred to as MWP) provided the winning margin in the anachronistic Electoral College. Numerous articles appear in the press describing specific, single or individual components of the triple whammy and the likely effect on Trump’s margin in MWP and how these three states may have tilted the Electoral College. In an article titled “How to Hijack an Election”, deBuys addresses all three factors in a generalized description but his lack of any numerical accounting allows the issue to fester without any definitive conclusion (aggravated by Trump’s tweets about the brilliance of his victory). This paper goes beyond deBuy’s analysis by examining, gleaning and coalescing actual facts and data from various research studies on each of the three components and then showing, with detailed mathematical accounting, how the aggregate vote impact of the three, individually and collectively, in each MWP state, more than exceeded Trump’s MWP margins—and thus led to his gaining the Presidency.

Trump’s view of the Electoral College is memorialized by Abadi.


“However, back in 2012 Trump was denouncing the very system that would eventually hand him the presidency. It was election night, and for a brief time, it seemed that Republican nominee Mitt Romney might win the popular vote over Barack Obama, while still losing the electoral vote.”

Abadi lists the Trump Tweet storm that ensued in this interim:

*The electoral college is a disaster for a democracy
* This election is a total sham and a travesty. We are not a democracy!
* He lost the popular vote by a lot and won the election. We should have a revolution in this country. This tweet was later deleted.
* More votes equals a loss... revolution!
* The phoney electoral college made a laughing stock out of our nation. The loser one (sic)!

Romney’s early lead in the popular vote did not hold up and Obama eventually won with 51.1% of the vote.

**Voter Suppression (The First Whammy)**

**Trump’s Voter Fraud Commission and Operation Crosscheck**

Given his severe disaffection for the role of the Electoral College, a logical early initiative for Trump would have been his forming a commission to study the role of the Electoral College and its possible elimination in the presidential election process. Instead, Trump falsely bragged about his electoral college win, as reported by Alexander⁴, as being “the biggest electoral college win since Ronald Reagan”. Instead of a commission to study the role of the anachronistic Electoral College, which he so aggressively tweeted against four years earlier, Trump appointed a commission to study “Voter Fraud”. Trump attributed his loss by 2.9 million popular votes as being due to 3 to 5 million fraudulent votes cast in the election - a claim disproved in detail by Blake⁵ who showed that “The Math disagrees”. Despite numerous studies which showed that the alleged voter fraud was a myth, Trump went ahead with the ill-

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fated commission and named Kris Kobach as commission co-chair. Kobach⁶,⁷, Kansas Republican Secretary of State, has been “for the better part of a decade, the key architect behind many of the nation’s anti-voter and anti-immigration policies”. As the commission proceeded a Democratic member⁸ sued the Commission claiming that he was being frozen out of the commission’s activities. One of the key initiatives Kobach and Trump sought to further institutionalize by the commission was “Operation Crosscheck” which Kobach had implemented before the 2016 Presidential Election in 28 primarily Republican states. Greg Palast, an award winning investigative journalist, has reported extensively and written a book describing both the intent and methodology of Operation Crosscheck⁹,¹⁰,¹¹. This voter suppression tool collected a massive data base in the 28 participating states on citizens who allegedly registered to vote in more than one state. As Palast describes, the process is so flawed and so cleverly designed that it effectively disfranchises significant percentages of African Americans, Latinos and those of Asian descent. Most interesting is the claim that multiple registration is an indication of fraud rather than the fact that people who move from one state to another rarely choose to (or remember) to cancel registration in the state they departed from. This is reflected, ironically, in the fact that five people in Trump’s inner circle were found to be registered to vote in two states¹² including:

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⁹ Greg Palast, Rolling stone, Aug 24, 2016, “The GOP’s Stealth War Against Voters” https://www.rollingstone.com/politics/features/the-gops-stealth-war-against-voters-w435890


Steve Bannon: Formerly Mr. Trump’s chief Strategist registered in Florida and New York
Tiffany Trump: Trump’s youngest daughter, registered in Pennsylvania and New York
Sean Spicer: former press secretary, registered in both Virginia and Rhode Island
Jared Kushner: Trump’s son-in-law and close advisor, registered in New York and New Jersey
Steven Mnuchin: Secretary of the Treasury, registered in New York and California

Palast describes how the system is allegedly designed to work.

“Crosscheck supposedly matches first, middle and last name plus birth date, and provides the last four digits of a Social Security Number for additional Verification.”

However, in practice, Palast, in examining lists from several states, found that

“Crosscheck’s results seemed at best deeply flawed. … We found that one fourth of the names on the list lacked a middle name match. The system can mistakenly identify fathers and sons as the same voter, ignoring designations of Jr. and Sr. A whole lot of people named “James Brown” are suspected of voting or registering twice, 357 of them in Georgia alone. But according to Crosscheck, James Willie Brown is supposed to be the same voter as James Arthur Brown, James Clifford Brown is allegedly the same voter as James Lynn Brown. … “

Palast refers to statistics which show that African-American, Latino and Asian names predominate in the Crosscheck matching process and that minorities are overrepresented in 85 of 100 of the most common last names. The names so selected are candidates for being purged from the voter registration roles. Some states send a postcard to the tagged individuals (frequently with an obsolete or wrong address) and if no response is received their voter registration is removed. The outcome is discriminatory to minorities.

As noted by Wagner13, by January of 2018, many of the 50 states that had been solicited to provide voter data to Trump’s Voter Fraud Commission, data similar to Operation Crosscheck, refused to provide the data and Trump disbanded the Commission but only after tweeting:

“the commission “fought hard” to investigate allegations of voter “abuses” because they know that many people are voting illegally, System is rigged, must go to the Voter I.D.” “

Typical of the sentiments opposing the Commission quoted by Wagner was that of former Missouri Secretary of State, Jason Kander who stated:

“President Trump created this sham voting commission to substantiate a lie he told about voter fraud in the 2016 election... when he couldn’t come up with any fake evidence, and under relentless pressure, he had no choice but to disband his un-American commission.”

An excellent summary listing the 27 participating states and the details of how Crosscheck works is an article by Santa Cruz Indivisible\textsuperscript{14}. Michigan and Pennsylvania were two of the 27 states using the Crosscheck system before the 2016 Presidential Election. Pennsylvania withdrew from Crosscheck in July 2017 after the Presidential Election.

**Voter Suppression Through ID Checks**

It is well known and verified by several Court decisions that voter suppression laws are a tactic that focuses on voter demographics for which a sizable majority vote for Democrats in states and or sub regions where voters provide an historic and sizable margin to Democrats. In addition to ID checks, voter suppression initiatives include reduction of early and Sunday voting, no same day registration, disallowing student IDs with out of state driver’s license IDs for out of state college students, and failure to work toward shortening long waits for polling places with heavy leanings to Democrats. Voter Suppression, both ID Checks and Operation Crosscheck, work as follows. Assume a district or state has a significant number of minorities, Latinos, elderly, disabled, poor, college students for which statistics show the intended voter suppression law will deter or prevent a significant portion of these voters from voting. Statistics and facts have shown that the type of ID frequently required has, for a sizable percentage of the targeted groups, been hard to acquire. Operation Crosscheck works to effectively cancel the registration of the same groups. Typically, such would be voters favor Democrats by an 80/20 margin. In general this can be characterized as follows: If the percentages in the historical voting pattern for the suppressed group is (D, R) where they vote D % for Democrats and R % for Republicans the advantage to the Suppression Proponents (by suppressing the vote of the sub group) is (D-R) %. If the state or district has a number, V, voters who do not vote because of the voter restriction tactic, the vote gained by the Suppressor group is V x (D - R)/100. With Trump’s small vote margin in the MWP states this factor has great significance. It will be shown that voter suppression through an ID law was a very significant factor in Trump’s margin in Wisconsin as was the Crosscheck process in Michigan and Pennsylvania.

**The Evidence for the Intent of Voter Suppression:**

The lack of a consensus agreement of the role of Voter suppression on the 2016 election is characterized by two contrasting articles. Lopez of Vox in an article titled “Voter Suppression

didn’t cost Hillary Clinton the Election” concluded that Voter suppression was not determinant in Trump carrying MWP or otherwise winning the election. On the other hand, a Mother Jones article titled “Rigged: How Voter Suppression Threw Wisconsin to Trump- And Possibly handed him the entire election” suggested the opposite.

Any discerning citizen who follows the broad spectrum of national news knows that there is a fierce national debate over the issue of voter registration laws that require photo type ID’s. The opponents of these laws assert that this broad national effort has the objective of suppressing the vote of minorities, the elderly, disabled and the poor that typically vote Democratic. Voter suppression initiatives take on various forms in addition to requiring a specific type of ID. Other measures include reduction of early and Sunday voting, no same day registration, caging, disallowing student IDs with out of state driver’s license IDs for out of state college students, and failure to work toward shortening long waits for polling places with heavy leanings to Democrats. There is no debate over the fact that this effort is heavily (almost exclusively) pursued by Republican legislators. This is witnessed by several studies which have found that there is little to no significant incidence of voter fraud (the alleged rationale for these laws) followed by court decisions which overthrew some of these efforts based on judges agreeing that the rationale was that of voter suppression being designed to favor the Republican party.

Wines of the NY times documents a statement made by Todd Albaugh, a staff aide to a Wisconsin state legislator, on Facebook, who quit his job in 2015 and left the Republican party because of what he witnessed at a Republican caucus meeting: Allbaugh’s statement on Facebook read:

“I was in the closed Senate Republican caucus when the final round of multiple Voter ID bills were being discussed. A handful of GOP Senators were giddy about the ramifications and literally singled out the prospects of suppressing minority and college voters. Think about that for a minute. Elected officials planning and happy to help deny a fellow American’s constitutional right to vote in order to increase their own chances to hang onto power.”

A second example from Wisconsin, listed by Wines is the following:


“In April of this year, Representative Glen Grotham, Republican of Wisconsin, predicted in a television interview that the state’s voter ID law would weaken the Democratic presidential candidate Hilary Clinton’s chances of winning the state in November’s election.”

Similar acknowledgements from Pennsylvania listed by Wines include the following:

“In Pennsylvania, the state Republican Party chairman, Robert Gleason, told an interviewer that the state’s voter ID law “had helped a bit” in lowering President Obama’s margin of victory over the Republican presidential nominee Mitt Romney in the state in 2012.”

In that same election, the Republican leader of the Pennsylvania House of Representatives, Mike Turzai, predicted during the campaign that the voter ID law would

“allow Governor Romney to win the state of Pennsylvania”.

Pennsylvania’s Voter ID law, enacted in 2012, was struck down by court order in 2014.

The Comey Letter to Congress-The Second Whammy

The second component of the Triple Whammy has been analyzed by Nate Silver18, of Five-Thirty-Eight fame, one of the nations most respected statistical analysts of polling data. Silver asserts that Comey’s Oct. 28 letter to Congress, and headlined throughout the Media, 11 days before the November 8th election, “cost Clinton the Election”. Trump quickly commented “great respect for the FBI .. this is bigger than Watergate”. Silver19 points out that because of the Comey letter, Clinton’s lead in the polls dropped from 5.7% to 2.9%, and her probability of winning dropped from 81% to 65%. The Comey letter said that the FBI had “learned of the existence of e-mails that appear to be pertinent to the investigation” that were allegedly on a computer owned by Anthony Weiner (the estranged husband of Clinton Aide Huma Abedin). This letter fed the flames of the Clinton e-mail controversy and according to Silver “left the door open for Trump to leapfrog her (Clinton)”. The fact that ex-Congressman Weiner, had gained national notoriety in a sexting scandal undoubtedly exacerbated the effect of the Comey letter described by Silver. Two days before the election, Comey, in effect, followed up with “Oops: False Alarm” but the correction was too late. The FBI announcement of the likelihood that Weiner’s computer had stores of missing Clinton emails turned out to be untrue but the fact that Trump’s campaign was under FBI investigation for possible collusion with Russia, since August of 2016, was in fact true, would have been of great impact on the election, but in contrast, was not revealed by the FBI until after the election. It is almost certain that

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18 Nate Silver, May , 2017, The Comey Letter Probably Cost Clinton the Election

either of these two individual factors, alone or in combination, would have changed the election results, had the release, non/release occurred in the opposite direction.

Republicans, in December 2017, took renewed issue with Comey and the FBI over their handling of the e-mail controversy. This is most ironic in light of the revelation\(^20\) that after the inauguration six Trump White House staffers used private email for official White House business. *This included Chief of Staff Reince Priebus, Chief Strategist Stephen Bannon, daughter Ivanka Trump, son-in-law Jared Kushner and advisors Stephen Miller and Gary Cohn.* This use of private email by key White House staffers occurred despite the tightening of the applicable law in 2014, after Clinton left office, and after the “lock her up” campaign.

The Comey factor was a onetime phenomenon and can be avoided in the future by the FBI and Justice Department adhering to rules that had been, and are, in place regarding disclosure of information related to on-going investigations. Voter Suppression and Fake News, however, pose a most serious continuing threat to the integrity of our election processes. This concern was further heightened in a report by Miller, Jaffe and Rucker\(^21\) who observe that “*Trump pursues Putin and leaves a Russian threat unchecked*”-the threat being the continued Russian meddling in U.S. elections. Numerous pundits have opined that the *“election is over, Trump won Fair and Square, and everyone should get over it”*. Such positions, coupled with the Trump administration doing nothing about the Russian Meddling and denying its role in the election, is contrary to the national interest. It is thus very important to chronicle, in a contemporary manner, the extraordinary forces that led to Trump becoming President and to remove the ambiguity of opinion on the effect of these forces that are described herein. While much has been written about all three factors, there is little detailed analysis on the mathematics of how Michigan, Wisconsin and Pennsylvania were “tilted” to Trump because of the Triple Whammy. When all three factors are examined with detailed mathematical accounting the implication of this papers title become conclusive.

**Fake News and Russian Meddling -The Third Whammy**

In January 2017 this writer posted a paper\(^22\) titled “Mathematics Shows That Fake News Elected Trump as President”. The paper focused on the effect of Fake News alone on election results in the three MWP swing states and how these three states, despite Clinton’s national 2.9 million


\(^{22}\) www.complexpolitics.wordpress.com
popular vote margin, tilted the electoral college results to Donald Trump. The assumption was made that Fake News efforts were “uniformly” applied to voters in all states, and despite this assumption of “no targeting” the paper concluded that Fake News alone tilted more than 39,000 votes away from Clinton yielding a Trump margin of 78,000 in MWP resulting in these three states Electoral College votes going to Trump. As noted in that paper “Any effort to apply mathematics to social and political phenomena is fraught with difficulty. Unlike Physics and Mathematics (and even Economics) there are no (or few) accepted theories or fields to which agreed upon formulas can be attached.” As a result analysts may draw different conclusions primarily because exposure and persuasion rates are subject to uncertainty. However, information that has come to light in the interim suggests the need to reexamine the issue in depth. Revelations since that time have found that these states “were targeted” by Fake News and that the reach and the exposure rate due to Russian “meddling” was far greater than known at the time and the “Fake News stories” were more slanted for Trump than was represented in the January paper.

A different conclusion from that of this writer (also in January 2017) was reached by Hunt Allcott, New York University and NBER, and Matthew Gentzkow, Stanford University and NBER, in a paper23 titled “Social Media and Fake News in the 2016 Election”. [Hereafter their paper is referred to as the AG1 paper and the authors are referred to as AG.] The AG1 paper was the result of extensive research and polling seeking to establish the exposure and persuasion rate of Trump and Clinton voters to Fake News and the likelihood of voters to change their vote after Fake News exposure. The unique feature of the AG research was their conducting of polling (to determine exposure rate) with both real Fake stories that had been circulated in social media (such as Facebook) along with “fake” Fake news stories (that had not been circulated)- a placebo like effect. Their finding was that those polled responded to having seen fake Fake news stories with a frequency almost as frequent as their having seen actual Fake news stories. This resulted in their estimating a significant reduction in the exposure rate that their analysis would have otherwise suggested. Their methodology, in absence of a definitive, explicit conclusion seeking to make the decision of whether Fake News led to Trump’s Electoral College victory, was to use the exposure rate reduced as described above, in combination with a comparison of the persuasive rate of Fake News to alter voting for or against a candidate, with the persuasive rate of ordinary TV campaign commercials. In their paper AG documented the results from several sources in the literature that had analyzed and made estimates of the persuasive rate of ordinary campaign TV commercials. Their paper reported values (for the effectiveness of TV campaign commercials) varying over a 50-fold range [ from .0002 to .01 (.02 % to 1%)]. Using the value of .0002 at the low end of this wide range of variation, and the adjusted exposure rate as described above, AG1 concluded that “for fake news to have changed the outcome of the election, a single fake article would need to have had the same persuasive effect as 36 television campaign ads with a .02% effectiveness.” The reader was thus led to conclude that in no way could Fake News stories be more persuasive than a combined 36 campaign TV commercials. With the adjustment of exposure rate as described, and their comparison to the persuasion rate of TV campaign commercials, the readers and numerous

23 Hunt Allcott and Matthew Gentzkow, NBER Working Paper No. 23089 Issued in January 2017,
pundits were left to conclude that Fake News did not affect the electoral college results in MWP. Gentzkow was later quoted24 “that conclusion depends on what readers think is a reasonable benchmark for the persuasiveness of an individual fake news story”.

By contrast, Anderson25 seeking a related statistic on persuasion rate found that 17% say that social media has helped to change their views on a specific political candidate with Democrats slightly more likely to do so. Craig Silverman26, reporting on a study done by IPSOS for BuzzFeed reported on respondents’ beliefs related to five Pro Trump/anti Hilary Clinton Fake News stories. For these five Fake News stories, between 64% and 84% of the respondents “recalled seeing the headlines and believed the subject articles to be very or somewhat accurate”.

In that context it is believed that AG, despite publishing an excellent academic paper, unfortunately, because of the wide spread acceptance of their implicit (or implied) conclusion and how it arose, led to disarming the press, the public, and our national and state government officials as to the real threat posed by Fake News. This is witnessed by several news articles in the press proclaiming that the AG1 paper settled the issue, namely that Fake News had no effect on the election. A typical example of these articles is that by Bershidsky27 whose Bloomberg article, citing the AG1 paper, proclaimed in its title:

“The Numbers ARE In: Fake News Didn’t Work”.

The Poynter Institute, in behalf of Facebook, (and reposted by Breitbart) also analyzed the issue 28 and determined that:

“it is worth considering the possibility that “fake news” stories did not significantly impact the presidential election after all”.


None of the various articles that appeared, similar to that of Bershidsky and Warren (of Poynter), commented on the obvious weakness in the AG1 implicit conclusion, i.e., that the conclusion was based on the comparison with the low-end estimate of persuasion rate of routine campaign TV commercials. It should be obvious to any discerning individual that Fake News such as the following had much more impact on persuasion rates than routine campaign commercials:

- A fake story on Facebook attributed to the nonexistent Denver Guardian which declared in all caps: “FBI AGENT SUSPECTED IN HILLARY EMAIL LEAKS FOUND DEAD IN APPARENT MURDER-SUICIDE.”
- A fake story picked up by British tabloids, Fox News, Russian news agencies and various right-leaning websites. Fox headlined its story: “Clinton aide says Foundation paid for Chelsea’s wedding.”
- A fake story stated the following: “News outlets around the world are reporting on the news that Pope Francis has made the unprecedented decision to endorse a US presidential candidate. His statement in support of Donald Trump was released from the Vatican this evening”
- A fake story published before the presidential election accused a restaurant, Comet Ping Pong, in Washington of being part of a child abuse ring led by Clinton and her campaign chairman, John Podesta

Allcott and Gentzkow apparently had second thoughts on their original AG1 paper (which had been published and described as a working paper). In their follow-up paper, AG2, with the same title as AG1, but published several months later, in the first paragraph of their conclusion, AG state:

“In the aftermath of the 2016 US presidential election, it was alleged that fake news might have been pivotal in the election of President Trump. We do not provide an assessment of this claim one way or another.”

This second paper, with this conclusion, is very significant for the following: Within days of the posting of this writer’s paper and the publication of AG1, on 6 January 2017, the Office of the Director of National Intelligence published a paper titled “Assessing Russian Activities and Intentions in Recent US Elections”30. Extracts listing the major assessments and conclusions made in this Intelligence assessment are listed in the Appendix to this paper. This Intelligence study, as shown by the extracts, make it clear that the Russian government was extensively involved in the effort to favor President-elect Trump and disparage Secretary Clinton by various means including extensive creation and pushing Fake News to a US audience. Two of the more telling assessments made in that paper are the following:

“Russian Campaign Was Multifaceted: Moscow’s use of disclosures during the US election was unprecedented, but its influence campaign otherwise followed a Russian messaging strategy that blends covert intelligence operations—such as cyber activity—with overt efforts by Russian Government agencies, state funded media, third party intermediaries, and paid social media users or “trolls.”

“Russia used trolls as well as RT as part of the influence efforts to denigrate Secretary Clinton. This effort amplified stories on scandals about Secretary Clinton and the role of Wikileaks in the election campaign.

Subsequent to the publication of this Intelligence Paper, extensive Congressional hearings were undertaken with findings of very extensive Russian involvement in structuring and purchasing ads in Facebook and Twitter (during the election) that were primarily anti-Clinton and which targeted key swing states including MWP. The AG reversal, the dramatic news of the Russian involvement (and the extent of that involvement), President Trump’s comments during his November 2017 stay in Vietnam implying his belief in the legitimacy of Vladimir Putin’s denial of Russian involvement, (which he later walked back) change the picture dramatically from that known in January 2017. This picture of the role of the Russian meddling has profound implications related to the future of US and other countries’ elections necessitating a relook at the mathematics of the role of Voter Suppression and Fake News in tilting MWP in the 2016 presidential election.

Objectives and Methodology of the Mathematical Analysis

Based on the facts described above, the narrowness of this writer’s earlier paper, and the ambivalence raised related to the importance of Fake News by the AG1 paper, the thrust of this paper is the following:

- Quantify the maximum impact of the Comey Letter and determine what fraction of the maximum vote swing was enough to switch MWP from Clinton to Trump
- Examine the parameters of Voter Suppression including Operation Crosscheck and Required ID’s to include the maximum effect and the percentage of maximum needed to switch MWP from Clinton to Trump
- Relook at the effect of Fake News on MWP considering the revelations of “targeting” and the revelations of the much wider Russian efforts in trolling Fake News to include their efforts on Facebook, Twitter and other Social Media and a more realistic assessment of persuasion rates.

• Examination of the totality of vote swings against the “smallness” of the Trump margin in MWP based on Fake News throughout the campaign of 2016, followed by the Comey Letter late in the campaign, both followed on election day by the influence of Voter Suppression.
• Use of “worst case/conservative bounding” of the key variables represented in the mathematical model and parametric analysis. The bounding is chosen to reduce the level of uncertainty that is inherently present in any analysis such as that undertaken herein.
• Construction of a mathematical framework in terms of a parametric analysis with all variables clearly identified. The objective is to make an explicit exposition leaving the reader with a clear understanding of the assumptions, the knowledge base and the various parameters used in the analytical studies.

Presidential Election Results in MWP in 2016

As shown in Table 1 below the electoral college margin for Trump was determined by the three swing states, MWP with the margins being Michigan 10,704 votes (.22%), Wisconsin 22,748 votes (.77%), and Pennsylvania, 44,282 votes (.72%). In Table 1 Trump’s margin in each of the three states is listed as Mt. When pollsters such as Nate Silver refer to polling statistics they list the candidates poll numbers as a percentage of the total, namely a percentage of those polled which is a prediction of the distribution of the projected national results on election day. In this case with two major candidates, a number of minor candidates and undecided voters, the sum of the percentages for the two major candidates is less than 100%. When Silver describes the Comey Letter as having had a 2.8% drop in voters favoring Clinton over Trump, the 2.8% is measured against the total votes for all candidates.

<table>
<thead>
<tr>
<th>Table 1: Key Vote Statistics From the 2016 U.S. Presidential Election#</th>
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<tbody>
<tr>
<td>Michigan</td>
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<tr>
<td>Clinton</td>
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<tr>
<td>Trump</td>
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<tr>
<td>All Others</td>
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<tr>
<td>Total Votes</td>
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<tr>
<td>Clinton plus Trump Votes</td>
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<tr>
<td>Trump Vote Margin by State Mt</td>
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<tr>
<td>Electoral College Delegates</td>
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<tr>
<td>Trump Total Vote Margin in Michigan, Wisconsin and Pennsylvania (MWP)</td>
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<tr>
<td>Clinton National Popular Vote Margin</td>
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<tr>
<td>Electoral College Votes for Each Candidate</td>
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# Data taken from Wikipedia
The Mathematics of How Each of the Three Whammies Effect Vote Margins

The Mathematics of the Comey Letter

Pundits have disagreed whether the Comey letter was determinant in switching MWP and the election to Trump. Media articles generally gloss over the numbers making general observations that are open to challenge and thus not conclusive. In particular, Pundits have indicated that it is unlikely that the full 2.8% switch reported by Silver in the Swing States could be attributed to the Comey Letter. Table 2 however indicates that only a relatively small fraction of the 2.8% observed in the polling data, reported by Silver, need to be ascribed to the effect of the Comey Letter to have been determinant in creating the switchover to Trump. Table 2, shows that only one twelfth (%) of the 2.8% estimated by Silver was enough to flip Wisconsin. Roughly one fourth (27%) of Silver’s estimate was enough to flip both Wisconsin and Pennsylvania. When viewed in this proper mathematical light one can easily conclude that the Comey Letter alone was determinant in causing the Electoral college to switch to Trump.

<table>
<thead>
<tr>
<th>Table 2. Estimate of Comey Letter Effect Compared to Trump’s Margin in Michigan, Wisconsin and Pennsylvania [Based on Nate Silver’s 2.8% Poll Shift Caused by Comey Letter]</th>
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</thead>
<tbody>
<tr>
<td><strong>Total Votes and Trump's Election Margin in MWP States</strong></td>
</tr>
<tr>
<td>Total Votes in MWP</td>
</tr>
<tr>
<td>Vtot</td>
</tr>
<tr>
<td>Trump Election Margin</td>
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<tr>
<td>Clinton Polling Lead Pre Comey Letter</td>
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<tr>
<td>Clinton Lead After Comey Letter</td>
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<tr>
<td>Estimated Maximum Votes Lost VL Due to Comey Letter VL =.028 x Vtot</td>
</tr>
<tr>
<td>Percent of Comey Letter Maximum Switched Votes Needed to Tilt MWP States 100 x Mt/ VL</td>
</tr>
</tbody>
</table>
Conservative Estimates of How Voter Suppression Through ID Checks Benefitted Trump in Wisconsin

In 2012 the Wisconsin legislature under the Republican control of governor Scott Walker signed a law requiring voters to show photo ID to vote. After lawsuits, U.S. District Judge Lynn Adelman in 2014 struck down the law and in his ruling determined that 300,000 registered Wisconsin voters lacked the type of ID needed to vote under the law 33. The law, with changes, was reinstated prior to the 2016 election. After the election Senator Tammy Baldwin (D. Wis), on May 17, 2017 posted the following on Twitter:

“Voter turnout in 2016 was reduced by approx. 200,000 votes because of WI’s photo ID laws.”

The Washington Post34 gave Senator Baldwin’s claim 3 Pinocchio’s finding that the claim went too far. Using data and a methodology from the U. S. General Accounting Office the Post suggested that the votes suppressed in Wisconsin totaled in the range of 61,00 to 94,000. In light of the various claims and counter claims, Kenneth Meyer, a University of Wisconsin political science professor, conducted a polling survey35 in Wisconsin’s Milwaukee and Dane counties and estimated, that in these two counties alone, 16,801 to 23,252 people were deterred from voting in the 2016 presidential election due to the Wisconsin photo ID law. The Wisconsin total population is four times larger than these two counties combined but allowing for the demographics, the extrapolation to a Wisconsin state wide total, as listed in the Mother Jones article, cited above, is only 45,000.

Table 3 lists a comparative analysis of data sources and based on conservative assumptions, shows how Trump’s Wisconsin margin (the largest of the three in MWP) was aided by the Wisconsin photo ID law and the resulting Voter Suppression. In conformance with the use of conservative underestimation of various effects on Trump’s margin the lesser of the Meyer and GAO estimates will be used hereafter.


35 Sam Levine. : Thousands of Voters Didn’t Cast a Ballot in Wisconsin Because of Voter ID, Study Finds”, Huffington Post, 9/26/2017, https://www.huffingtonpost.com/entry/wisconsin-voter-id_us_59ca6e60e4b01cc57ff5bddd5
Table 3: Estimates of the Effect of Voter Suppression Through ID Checks on Trump’s 2016 Margin in Wisconsin

<table>
<thead>
<tr>
<th>Vote Differences from 80/20 split</th>
<th>Estimate of Votes Suppressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trump Election Margin in Wisconsin</td>
<td>Meyer Analysis for Two Wisconsin Counties</td>
</tr>
<tr>
<td>Number of Wisconsin Voters Not Voting Due to Photo ID Law</td>
<td>23,000</td>
</tr>
<tr>
<td>Vote Differential Lost by Clinton Due to Voter ID Law in Wisconsin Based on 80%/20% split ((.80\cdot.20)\times.9\times45,000=24,300#)</td>
<td>24,300</td>
</tr>
<tr>
<td>Actual Trump Margin in Wisconsin</td>
<td>22,748</td>
</tr>
<tr>
<td>Projected Trump Wisconsin Margin had Voter ID Law Not been in Effect</td>
<td>## - 1,552</td>
</tr>
</tbody>
</table>

\# Factor of .9 used to reflect likelihood of 10% of otherwise registered voters who might not have voted even had they not been purged.
\## Negative numbers indicate a Clinton Margin after adjustment of purged voters by ID Checks

After adjusting Trump’s Wisconsin margin with a conservative estimate (Meyer rather than GAO), of votes loss due to voter suppression through the ID Check, it is concluded that Trump carried Wisconsin as a result of the Wisconsin ID Check Process alone. When added to the effect of the Comey Letter, the evidence is overwhelming that these two Whammies more than gave Trump his Wisconsin margin.

The Mathematics of Operation Crosscheck

Table 4 below contains data by Palast, References 9 and 10, from Operation CrossCheck files listing the number of voters names pulled for screening allegedly for suspicion of double voting because of being registered to vote in two states. Palast, Reference 10, dated Nov. 11, 2016 states:

“Trump signaled the use of “Crosscheck” when he claimed the election is “rigged” because people are voting many, many times.... His operative Kobach, who also advised Trump on building a wall on the southern border, devised a list of 7.2 million “potential” double voters—1.1 million which were removed from the voter rolls by Tuesday”.

Tuesday, referenced in the quote was election day, Nov. 8, 2016. The purge percentage was thus 15.3%.
Table 4: Number of Voters Names “Pulled” and Numbers Purged by Operation Crosscheck and Estimates of Clinton Votes Lost Adding to Trump’s Margin.

<table>
<thead>
<tr>
<th>State</th>
<th>Number Pulled C By Crosscheck</th>
<th>Estimate of 15.3 % Purged P= C x .153</th>
<th>Democratic Votes Lost (80%/20% Split)# P x .6 x .9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>449,000</td>
<td>68,697</td>
<td>37,096</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>344,000</td>
<td>52,632</td>
<td>28,421</td>
</tr>
</tbody>
</table>

# Computed on the basis of 60% lost to Clinton because of the assumed 80%/20% split. The multiplier factor of .9 is used to account for 10% of previously registered voters potentially not voting regardless of being purged by Crosscheck.

Table 4 shows that Operation Crosscheck alone effectively took over 37,000 votes away from Clinton in Michigan which was three times larger than Trump’s eventual margin of 10,704 votes. In Pennsylvania, Crosscheck alone took over 28,000 votes from Clinton which was more than half of Trump’s Pennsylvania margin of 44,282 votes.

The Mathematical Model for the Effect of Fake News

This model includes the major variables employed in the mathematics by AG1 but differs in the mathematical derivation and final structure relating switched votes to the exposure and persuasion rates. Additionally, estimates of the exposure rates due to the intelligence findings and the Congressional hearings are significantly increased. The final results are expressed in a parametric form where needed persuasion rates to switch winners is compared to the .0002 to .01 range of persuasion rates listed by AG1.

Definition of Variables

| VBc | Number of votes in a specific MWP state for Clinton before any switching of votes |
| VBT | Number of votes in a specific MWP state for Trump before any switching of votes |
| VAc | Number of votes in a specific MWP state for Clinton after vote switching |
| VAT | Number of votes in a specific MWP state for Trump after vote switching |
| DVC | Aggregate number of votes in a specific state that switch away from Clinton. Difference between votes switched away from Clinton minus votes switched to Clinton) because of Fake News. |
| Ec  | exposure rate of Fake News per voter initially inclined to Clinton (before switching) |
| Et  | exposure rate of Fake News per voter initially inclined to Trump (before switching) |
| Pc  | persuasion rate of initial Clinton voters likely to switch to Trump because of anti-Clinton or pro-Trump Fake News |
| Pt  | persuasion rate of initial Trump voters likely to switch to Clinton because of anti-Trump or pro-Clinton Fake News |
| Mt  | Trump popular vote margin in a specific MWP state |
| FNM | Fake News Margin. The number of votes contributing to Trump’s margin by Fake News |
Assumptions:

The equation that represents the aggregate of switched votes away from Clinton to Trump is the following:

\[
D_{VC} = VB_c \times Ec \times Pc - VB_t \times Et \times Pt
\]

In structuring Equation (1) voters initially voting for all “other” candidates are not included. Realistically, significant numbers of those voters were not inclined to vote for either dominant candidate and thus are significantly less likely to change their vote to either dominant candidate because of Fake News against or for either. Additionally, the vote totals for the other candidates in MWP were relatively small, in comparison to the two major candidates, their inclusion would needlessly complicate the analysis. However, the votes switched “to” the “other” candidates resulting from Fake News will be accounted for in the model.

After the vote switching each candidate has a number of votes given by:

\[
\begin{align*}
V_{Ac} &= VB_c - VB_c \times Ec \times Pc = VB_c [1 - Ec \times Pc] \\
V_{At} &= VB_t - VB_t \times Et \times Pt = VB_t [1 - Et \times Pt]
\end{align*}
\]

This estimate says that the vote switching is proportional to the number of votes VBc or VBt either Clinton or Trump had before exposure to the Fake News times the exposure rate, either Ec or ET times the Persuasion Rate Pc or Pt.

Observing that \(1 >> Ec \cdot Pc\) and \(1 >> 1 - Et \cdot Pt\) and thus \(V_{Ac} \approx VB_c\) and \(V_{At} \approx V_{Bt}\), one can thus write Equation (1) as

\[
D_{VC} = V_{Ac} \times Ec \times Pc - V_{At} \times Et \times Pt
\]

At the outset one notes that amongst the voters initially inclined to vote for Clinton or Trump, Clinton loses votes to Trump if the term \(V_{Ac} \times Ec \times Pc\) is greater than the term \(V_{At} \times Et \times Pt\). Data reported before the Intelligence findings, and listed in AG1, indicate that \(Ec\) was 3 to 6 times larger than \(Et\). The Congressional hearings on the Russian Fake news effort indicates the exposure slant to Fake News against Clinton and pro Trump was even much larger than the 3 to 6 factors stated above. The Wall Street Journal on Nov. 7, 2017 reported on this slant in various periods on Twitter before election day as varying between 10 to 1, 40 to 1 and 30 to 1 pro Trump/anti-Clinton.\(^{36}\)

The slant factor is represented by

\[
Ec = q \times Et
\]

\(^{36}\) Mark Marmont and Rob Berry, The Wall street Journal, Nov. 7, 2017 “Russians Supported Trump Early”
where q is the slant factor. A conservative value of q = 4 will be used throughout. Despite the extremely negative news/facts against Trump, those inclined to support him were less likely deterred by the news, real or fake, and less likely to switch than Clinton supporters, implying that Pc > Pt. Recall, for example

a.) Trump’s statement “I could shoot someone on fifth avenue in New York City and I would not lose any votes” and b.) Trump’s election despite the Access Hollywood video.

For the three MWP states VAt ≈ VAc (See Table 1) and with Pc > Pt, replacing VAt with VAc and Et with Ec we can write Equation (5) as

\[ VAc \times Ec \times Pc - VAc \times \left(\frac{Ec}{q}\right) \times Pc \leq DVc. \]

In replacing Pt with Pc in the second term, with Pc>Pt, the value of the second term in this equation is increased thus reducing the value of the combined two terms leading to the \( \leq \) inequality. Here it is assumed that votes inclined to “other” candidates are unchanged by Fake News for or against either Clinton or Trump. However, voters inclined to Trump or Clinton could switch to another minor candidate as a result of being exposed to Fake News. This type switch would reduce the DVc margin by one vote. However, a vote previously for Clinton that switched to Trump would reduce the DVc margin by two votes (or vice versa). By assuming these two types of switches are equally probable the average of the two types is \( \frac{1}{2} \times [1+2] = 3/2. \) This leads to the Fake News Margin (FNM) derived from Equation (6) with the 3/2 adjustment

\[ FNM \geq \frac{3}{2} \times VAc \times Ec \times Pc \times (1-1/q). \]

By computing FNM by the expression on the right-hand side of Equation (7) one is underestimating the vote margin provided to Trump by Fake News. Fake News, the third whammy, thus contributed an estimated number of votes to Trump’s margin by a quantity exceeding FNM computed by Equation (8) below.

\[ FNM = 1.5 \times VAc \times Ec \times Pc \times (1-1/q). \]

With the precedent of AG1 comparing the effect of Fake News (persuasion rate Pc) with ordinary campaign TV commercials this paper will examine the Fake News effect parametrically through solving for Pc from Eq. (8) and examining the results with the range of Pc from .0002 to .01. Figures 1, 2 and 3 are graphs of Pc vs Ec with Pc computed by Equation (9) below.

\[ Pc = \frac{FNM}{1.5 \times VAc \times Ec \times (1-1/q)} \text{ for a slant factor } q = 4. \]

for three levels of Trump margin in Michigan, Wisconsin and Pennsylvania. An analysis of the Exposure Rate to Fake News is done in the following section.
Exposure Rate Ec and Interpretation of the Reach of Fake News

Definitions of Exposure Rate

The literature describes exposure variously in terms of shares, page visits, reach, and visitations. AG conducted an online post-election survey of 1200 voters and a data base of 156 election related stories, 115 pro Trump (30 million shares) and 41 pro Clinton. (7.6 million shares). AG then used a ratio of 20-page visits per share (not referenced) yielding 760 million instances of a user “clicking through and reading a fake news story). Assuming a voting age population of 254 million they came up with an exposure unit of nominally 3.0 per voter which they adjusted to 1.04 due to the polling results and the placebo effect described earlier. In AG1 Allcott and Gentzkow then applied an adjustment factor for the slant ratio in the stories and merged the Trump and Clinton components of the model yielding an equation similar to Eq. (8)

\[(10) \ 0.69 \times Ec \times Pc = 0.0051\]

The value of .51% was the AG1 estimate of the fractional vote adjustment needed to convert Wisconsin. AG1 then set \(Pc = n \times 0.0002\) with \(Ec = 1.04\) using the low end (.02%) or .0002 of the range described earlier as the persuasion rate of TV campaign commercials. This resulted in

\[(10) \ n = \frac{0.0051}{(0.69 \times 0.0002 \times 1.04)} = 36\]

and their conclusion that for Fake news to have altered Trump’s carrying MWP would require that the average Fake News story would have to be as persuasive as 36 TV campaign commercials. Most significantly, as noted above, this observation/conclusion was not included in AG2.

As noted in the introduction to this paper, Congressional hearings have led to the discovery that the voting public was exposed to a concerted Russian effort that, as will be shown, led to significantly larger exposure rates than that used by AG1 and AG2.

The Exposure Rate Generated by Russian Fake News

Timberg of the Washington Post relates how Facebook, prior to the Congressional investigation said that ads paid for by Russian operatives had reached 10 million of its users.

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37 Craig Timberg, The Washington Post, Oct 5, 2017 “Russian Propaganda may have been shared hundreds of millions of times, new research says; https://www.washingtonpost.com/news/the-switch/wp/2017/10/05/russian-propaganda-may-have-been-shared-hundreds-of-millions-of-times-new-research-says/?utm_term=.f97c71e744a3
After Congressional hearings this number was increased to 126 million for Facebook alone, 150 million when Instagram was included then 288 million when Twitter was included. In light of this new data, the Facebook creator and CEO, Mark Zuckerberg, has apologized for his earlier statement “I think it was a crazy idea to suggest that Fake News on Facebook helped sway the election”. The Russian operation is reported to have been executed by 1000 operatives working on Facebook, Twitter, Reddit, Google, Instagram and other social media. Facebook handed over 3000 ads to the Congressional Investigators and indicated that “126 million of its users may have seen content produced and circulated by Russian operatives.” Timberg reports on a study done by Jonathan Albright of the Columbia University Tow Center for Digital Journalism. Albright, in an effort to describe “organic reach”, stated:

“To understand Russia’s meddling in the U.S. election, the frame should not be the reach of the 3,000 ads that Facebook handed over to Congress and that were bought by a single Russian Troll Farm called the Internet Research Agency. Instead the frame should be the reach of all the activity of the Russian-controlled accounts—each post, each ‘like’, each comment and also all of the ads’.”

In his study Albright used a Facebook-owned analytics tool called “Crowd Tangle” to measure the Russian campaign in terms of shares. For six of the 470 sites that had been made public Albright found that the content had been “shared” 340 million times. Extrapolation to the 470 sites would yield 27 billion shares. However, Karpf in his description of how Tangle works, and the tricks used by Russian trolls, comments that “the trouble with digital indicators like these (Crowd Tangle) is that they are easy to inflate”. Karpf’s observation suggests severe inaccuracy would result from simple proportional extrapolation of Albright’s numbers for six stories to 470. Accordingly, again seeking to be conservative, herein we limit the extrapolation to 5% (.05) and 10% (.1) of the 100% extrapolation. Also, data generally reported, such as Albright’s assumes the exposure is uniform across the voter age population. The Congressional hearings have indicated that the Russian efforts targeted key states with attention to MWP. Accordingly, the data in Tables 4 and 5, applicable to MWP, introduces a factor of 1.5 for targeting on the Exposure rates that are otherwise based on uniform exposure.

The Wall Street Journal, referenced above, reported that the Kremlin support for Donald Trump on social media began much earlier than previously known. The Journal analyzed 150,000 deleted tweets that Twitter had identified in a group of 2,752. The Journal stated:

“The Russian backed Twitter accounts were so successful imitating Americans that they were frequently followed and retweeted by prominent people including Trump campaign insiders and mainstream Media, including General Michael Flynn and Fox commentator Sean Hannity.”

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38 David Karpf, Monkey Cage, October 12, 2017, “People are hyperventilating over ma study of Russian propaganda on Facebook. Just breathe deeply”
Based on the range of exposure data described in the above references, and the caveats, a conservative range of 11.8 to 23.6 is estimated in Table 5. Below and (12 and 24) will be used in the parametric analysis for the likely effect of Fake News. Given the observation made at the outset that Exposure Rate estimates are so fraught with uncertainty, a comparison is made in Table 6 below of the exposure rates estimated in Table 5 with the Exposure Rate estimated by AG1.

As this paper was being prepared an article by O’Sullivan and Seagall provided additional information on the extent of ostensible Russian accounts on Twitter. The article states:

“"In September Warner (Senator Warner of Virginia) said…the company said it had found only 200 accounts on its platform linked to the troll army. By late October Twitter had found 2,700 accounts it said were run by the Internet Research Agency. .”

Note that the conservative estimate in Table 5 was based on only the 470 Facebook accounts described and the extrapolation from six accounts to 470 accounts was limited to 5% and 10% of the full mathematical extrapolation. As noted there is a measure of uncertainty in applying mathematics to the two key variables of exposure rate Ec and persuasion Pc and as a result this paper has chosen to be very conservative in choosing the data from which these two variables were derived. Tables 5, 6 and 7 below summarizes the conservative factors leading to the choices made.

---

Table 5: Conservative Extrapolation of Albright Data on Exposure Rate from Six Fake News to 340 Revealed in Congressional Hearings [With Adjustments for Karpf’s Analysis and Targeting].

<table>
<thead>
<tr>
<th>Expos. Rate for Albright</th>
<th>Exposure Rate Ec Calculations for Face book Alone</th>
<th>Exposure Rate Ec Adjustment Estimates for Facebook, Reddit, Twitter, Google and Instagram Factor of 1.5</th>
<th>Exposure Rate Ec Extrapolation with Karpf Factor of 5%</th>
<th>Exposure Rate Ec Extrapolation with Karpf Factor of 10 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure Rate for Albright 340 Million shares for Six Russian accounts alone of the 470 accounts [340/254]</td>
<td>1.34</td>
<td>2.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td># Extrapolation to 470 Accounts With Karpf [5% and 10%] and No Targeting &amp; [2.01 x 470/6] x [.05 and .10]</td>
<td>7.9 &amp;</td>
<td>15.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment by 1.5 due to Targeting in MWP</td>
<td>11.8 #</td>
<td>23.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Extrapolation to 340 Fake News from 6 was conservatively limited to 5% and 10% due to redundancies suggested by Karpf not likely detected by Facebook’s Crowd Tangle in Albright’s analysis.
### Table 6: Comparison of Exposure Rates Estimated in This Paper with AG

<table>
<thead>
<tr>
<th></th>
<th>AG1 and AG2</th>
<th>This Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Base of 156 Stories</td>
<td></td>
<td>Data on 6 Russian Accounts With Conservative Extrapolation to 470 Accounts</td>
</tr>
<tr>
<td>Facebook Alone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Fake Stories</td>
<td>156</td>
<td></td>
</tr>
<tr>
<td>Estimated Shares</td>
<td>37.6 million</td>
<td>340 million shares for 6 Accounts (Facebook alone)</td>
</tr>
<tr>
<td>Clicks and Reads (20 per share)</td>
<td>760 million</td>
<td></td>
</tr>
<tr>
<td>No. of Adults of Voting Age</td>
<td>254 million</td>
<td>254 million</td>
</tr>
<tr>
<td>Exposure Rate: Clicks and Reads per Adult</td>
<td>3</td>
<td>1.34 Facebook alone 2.01 For all Social Media (Increase by 1.5)*</td>
</tr>
<tr>
<td>AG Adjustment #</td>
<td>1.04</td>
<td># AG adjustment for those polled who recalled seeing “fake” Fake News</td>
</tr>
<tr>
<td>This Paper’s 5 % Extrapolation</td>
<td>( 2.01 \times 1.5 \times (470/6) \times .05 = 11.8 )</td>
<td>11.8 For 5 % extrapolation from 6 to 470 accounts and a factor of 1.5 for targeting MWP</td>
</tr>
<tr>
<td>This Paper’s 10 % Extrapolation</td>
<td>( 2.01 \times 1.5 \times (470/6) \times .10 = 23.6 )</td>
<td>23.6 For 10% extrapolation from 6 to 470 accounts and a factor of 1.5 for targeting MWP</td>
</tr>
</tbody>
</table>
Table 7: Summary of Conservative Choices of Model Input Parameters

<table>
<thead>
<tr>
<th>Area of Uncertainty</th>
<th>Choice Available</th>
<th>Values Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Votes changed by Comey Letter</td>
<td>Up to 2.8% Would have affected vote margin in MWP by 2.8%</td>
<td>(8% and 27 %) of 2.8%</td>
</tr>
<tr>
<td>Estimate of Votes Suppressed in Wisconsin</td>
<td>Senator Baldwin 2,000,000 GAO 61,000 Professor Meyer 45,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Exposure Rate to Fake News</td>
<td>Facebook, Twitter, Reddit, Instagram, Google 470 Stories in Facebook alone Extrapolation of exposure rate from 6 Facebook stories to 470 Facebook Stories Extrapolation Factor 470/6</td>
<td>[470/6] x .05 and [470/6] x .10</td>
</tr>
<tr>
<td>Estimate of Adding Twitter, Instagram And Google to Facebook Data</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>Slanting of Fake News Anti-Clinton vs. Anti-Trump</td>
<td>AG 6 to 1 to 3 to 1 Wall Street Journal 10 to 1, 30 to 1 and 40 to 1</td>
<td>4 to 1</td>
</tr>
<tr>
<td>Targeting</td>
<td>Unknown</td>
<td>1.5</td>
</tr>
</tbody>
</table>

With the new revelations of the breadth of Russian activity to include targeting we conservatively estimate that the Exposure Rate to Fake News, Ec, varied between 12 and 24 for the combined Social Media of Facebook, Twitter, Instagram, Google etc. Figures 1, 2 and 3 provide a parametric graphical analysis showing how this range of Ec provides needed Persuasion Rates (for all three states) at the very low end of the (.0002 to .01) rates for ordinary campaign TV commercials. Given the nature of the falsehoods described in the numerous Fake Stories that were circulated by Russian trolls and others in the 2016 Presidential campaign, reason suggests that typical Fake Stories were more effective than routine campaign TV commercials. Given that these three Figures indicate that MWP was tilted even with the very low range of Pc (similar to TV campaign commercials) one can conclude the following. Since the actual impact of Fake News at the exposure rates found herein are logically concluded to be far more persuasive than TV campaign commercials this leads to the conclusion that Fake News alone was enough to provide Trump’s Electoral Collège win.
Figure 1: Required Persuasion Rate as a function of Exposure Rate for Switching 1/4, 1/2 and All of Trump’s Michigan Margin of 10,704 Votes

\[ Pc = \frac{FNM}{1.5 \times VAc \times Ec \times (1 - 1/q)} \]
Figure 2: Required Persuasion Rate as a function of Exposure Rate for Switching 1/4, 1/2 and All of Trump's Wisconsin Margin of 22,748 Votes

\[ Pc = \frac{FNM}{1.5 \times VAc \times Ec \times (1 - 1/q)} \]
Table 8. lists the required numerical values for the needed Persuasion Rates $P_c$ for Fake News alone to equal the Trump Margin, $M_t$ in each of the MWP states. The values for Exposure Rate used are the values in a range 12 to 24 estimated in Table 6, and the value at midpoint, 18. Table 9 lists the Fake News Margin $FNM$ for each MWP state for various values of Exposure rate between the two extremes 0.0002 and 0.01 listed by AG. Like Figures 1, 2 and 3, these two tables establish that Fake News alone, was of such impact that it led to vote switching exceeding Trump’s final vote margin in Michigan, Wisconsin and Pennsylvania which in turn tilted the Electoral college and the election to Donald Trump.
Table 8: Persuasion Rates as a Function of Exposure Rate Needed to Equal Trump's Margin in Each MWP State from Fake News Alone

<table>
<thead>
<tr>
<th></th>
<th>Michigan</th>
<th>Wisconsin</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAc#</td>
<td>2,268,839</td>
<td>1,382,536</td>
<td>2,926,451</td>
</tr>
<tr>
<td>Mt##</td>
<td>10,704</td>
<td>22,748</td>
<td>44,282</td>
</tr>
<tr>
<td>Ec</td>
<td>Persuasion Rates Pc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.00035</td>
<td>0.00122</td>
<td>0.00112</td>
</tr>
<tr>
<td>18</td>
<td>0.00023</td>
<td>0.00081</td>
<td>0.00075</td>
</tr>
<tr>
<td>24</td>
<td>0.00017</td>
<td>0.00061</td>
<td>0.00056</td>
</tr>
</tbody>
</table>

# VAc = Clinton's Total Votes in Each MWP State,  ## Mt = Trump's Margin in Each MWP State
Ec= Exposure Rate,  Pc = Persuasion Rate
Table Entries Computed By:  \( Pc = \frac{Mt}{[1.5 \times VAc \times Ec \times (1-1/q)]}, \ q = 4 \)
### Table 9: Margin Provided by Fake News Alone for a Range of Persuasion Rates

<table>
<thead>
<tr>
<th></th>
<th>Michigan</th>
<th>Wisconsin</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAC</td>
<td>2,268,839</td>
<td>1,382,536</td>
<td>2,926,451</td>
</tr>
<tr>
<td>Mt</td>
<td>10,704</td>
<td>22,748</td>
<td>44,282</td>
</tr>
<tr>
<td>Pc</td>
<td>Ec</td>
<td>Vote Margin Caused by Fake News</td>
<td></td>
</tr>
<tr>
<td>0.0002</td>
<td>12.0</td>
<td>6,126</td>
<td>3,733</td>
</tr>
<tr>
<td>0.0005</td>
<td>12.0</td>
<td>15,315</td>
<td>9,332</td>
</tr>
<tr>
<td>0.0010</td>
<td>12.0</td>
<td>30,629</td>
<td>18,664</td>
</tr>
<tr>
<td>0.0015</td>
<td>12.0</td>
<td>45,944</td>
<td>27,996</td>
</tr>
<tr>
<td>0.0050</td>
<td>12.0</td>
<td>153,147</td>
<td>93,321</td>
</tr>
<tr>
<td>0.0100</td>
<td>12.0</td>
<td>306,293</td>
<td>186,642</td>
</tr>
<tr>
<td>0.0002</td>
<td>18.0</td>
<td>9,189</td>
<td>5,599</td>
</tr>
<tr>
<td>0.0005</td>
<td>18.0</td>
<td>22,972</td>
<td>13,998</td>
</tr>
<tr>
<td>0.0010</td>
<td>18.0</td>
<td>45,944</td>
<td>27,996</td>
</tr>
<tr>
<td>0.0015</td>
<td>18.0</td>
<td>68,916</td>
<td>41,995</td>
</tr>
<tr>
<td>0.0050</td>
<td>18.0</td>
<td>229,720</td>
<td>139,982</td>
</tr>
<tr>
<td>0.0100</td>
<td>18.0</td>
<td>459,440</td>
<td>279,964</td>
</tr>
<tr>
<td>0.0002</td>
<td>24.0</td>
<td>12,252</td>
<td>7,466</td>
</tr>
<tr>
<td>0.0005</td>
<td>24.0</td>
<td>30,629</td>
<td>18,664</td>
</tr>
<tr>
<td>0.0010</td>
<td>24.0</td>
<td>61,259</td>
<td>37,328</td>
</tr>
<tr>
<td>0.0015</td>
<td>24.0</td>
<td>91,888</td>
<td>55,993</td>
</tr>
<tr>
<td>0.0050</td>
<td>24.0</td>
<td>306,293</td>
<td>186,642</td>
</tr>
<tr>
<td>0.0100</td>
<td>24.0</td>
<td>612,587</td>
<td>373,285</td>
</tr>
</tbody>
</table>

Margin = 1.5 \times VAC \times Ec \times Pc \times (1 - 1/q), \ q = 4
Conclusion: The Triple Whammy led to Trump Winning the Electoral College
Votes of Michigan, Wisconsin and Pennsylvania and the Presidency in 2016

This paper, using data from public sources and Congressional Hearings, detailed analysis and mathematics, using very conservative estimates, leads to the following:

I. The Comey Letter effect was more than enough to exceed the Trump margin in each of the three MWP states. Only 8% (one twelfth) of the Comey 2.8% effect was needed to tilt Michigan and 27% (roughly one fourth) of the 2.8% was needed to switch Wisconsin and Pennsylvania.

II. The analysis shows that in Michigan, Trump’s margin was so small that the projected effect of any of the three whammies alone, the Comey Letter, Operation Crosscheck or Fake News created the margin.

III. Trump’s margin in Wisconsin was so small that analysis shows that omitting the Comey effect, Voter Suppression through ID Checks alone was sufficient to tilt Wisconsin.

IV. Fake News alone, when using the exposure rate based on the Intelligence and Congressional Findings and using realistic Persuasion Rates was enough to tilt all three MWP states and the election to Trump.

It was shown that three factors, the Comey Letter, Voter Suppression (Voter ID and Operation Crosscheck) and Fake News taken alone (individually) or in combination more than establish the thesis of this paper.

About the Author: Harold Breaux is a retired research mathematician having published numerous research papers, including in refereed journals in the open literature, on mathematical modeling topics in ballistics, weapons design, effectiveness and accuracy, statistical analysis, and probability and laser propagation and damage effects. His research focused on finding novel methods for solving complex problems with simple mathematical models. His success in these efforts garnered numerous awards and his models have been and are being used in DoD Laboratories and by Defense contractors nationwide. He is also noted for his pioneering efforts in leading Army and DoD initiatives in acquiring and exploiting supercomputers for Defense research. In retirement his keen interests in public policy and government has led to his applying the research and mathematical skills honed over his long career to topics in government and politics.
APPENDIX (Extracts from U.S. Intelligence Assessments)

The extracts below are taken from a document titled “Assessing Russian Activities and Intentions in Recent US Elections” Intelligence Community Assessment, prepared and published by the Office of the Director of National Intelligence, 6 January 2017

0 Moscow’s approach evolved over the course of the campaign based on Russia’s understanding of the electoral prospects of the two main candidates. When it appeared to Moscow that Secretary Clinton was likely to win the election, the Russian influence campaign began to focus more on undermining her future presidency.

O We assess with high confidence that Russian military intelligence (General Staff Main Intelligence Directorate of GRU) used the Guccifer 2.0 persona and DCLeaks.com to release US victim data obtained in cyber operations publicly and in exclusives to media outlets and relayed material to Wikileaks

Putin Ordered Campaign to Influence US Election

O We also assess Putin and the Russian Government aspired to help President-Elect Trump’s election chances when possible by discrediting Secretary Clinton and publicly contrasting her unfavorably to him. All three agencies agree with this judgement. CIA and FBI have high confidence in this judgement. NSA has moderate confidence.

O Putin most likely wanted to discredit Secretary Clinton because he has publicly blamed her since 2011 for inciting mass protests his regime in late 2011 and early 2012 and because he holds a grudge for comments he almost certainly saw as disparaging to him in early 2012.

Russian Campaign Was Multifaceted

O Moscow’s use of disclosures during the US election was unprecedented, but its influence campaign otherwise followed a Russian messaging strategy that blends covert intelligence operations-such as cyber activity- with overt efforts by Russian Government agencies, state funded media, third party intermediaries, and paid social media users or “trolls.”

Public Disclosures of Russian Collected Data

O We assess with high confidence that the GRU used the Guccifer 2.0 persona, DCLeaks.com and Wikileaks to release US victim data obtained in cyber operations publicly and exclusives to media outlets.

We assess with high confidence that the GRU relayed material it acquired from the DNC and senior Democratic officials to Wikileaks. Moscow most likely chose Wikileaks because of its self-proclaimed reputation for authenticity. Disclosures through Wikileaks did not contain any evident forgeries.

Russia Today (RT) and Russian Propaganda Efforts.
The Kremlin’s principal international propaganda outlet RT (formerly Russia Today) has actively corroborated with Wikileaks. RT’s editor-in-chief visited Wikileaks founder Julian Assange at the Ecuadorian Embassy in London in August 2013 where they discussed renewing his broadcast contract with RT, according to Russian and Western media. Russian media subsequently announced that RT had become “the only Russian media company” to partner with Wikileaks and had received access to “new leaks of secret information.” TRT routinely gives Assange sympathetic coverage and provides him a platform to denounce the United States.

State owned Russian media made increasingly favorable comments about President-elect Trump as the 2016 US general and primary election campaigns progressed while consistently offering negative coverage of Secretary Clinton.

On 6 August RT published an English-language video called “Julian Assange Special: Do Wikileaks Have the Email That’ll Put Clinton in Prison?” and an exclusive interview with Assange titled “Clinton and ISIS Funded by the Same Money.” RT’s most popular video on Secretary Clinton, “How 100% of the Clinton’s Charity Went to Themselves,” had more than 9 million views on social media platforms. RT’s most popular English language video about the President-elect “Trump Will Not be Permitted to Win”, featured Assange and had 2.2 million views.

Russia used trolls as well as RT as part of the influence efforts to denigrate Secretary Clinton. This effort amplified stories on scandals about Secretary Clinton and the role of Wikileaks in the election campaign.

A journalist whom is a leading expert on the Internet Research Agency claimed that some social media accounts that appear to be tied to Russia’s professional trolls—because they previously were devoted to supporting Russian actions in Ukraine—started to advocate for President-elect Trump as early as December 2015.

RT Focuses on Social Media, Building Audience

According to RT management, RT’s website receives at least 500,000 unique viewers every day. Since its inception in 2005, RT videos received more than 800 million views on YouTube (1 million views per day), which is the highest among news outlets (see graphics for comparison with other news channels)(AKT 4 October.)

RT states on its website that it can reach more than 550 million people worldwide and 85 million people in the United States: however, it does not publicize its actual US audience numbers(RT, 10 December).

Formal Disassociation from Kremlin Facilitates RT US Messaging

RT America formally disassociates itself from the Russian Government by using a Moscow-based autonomous nonprofit organization to finance its US operations. According to RT’s leadership, this structure was set up to avoid the Foreign Agents Registration Act and to facilitate licensing abroad.